

OCCASIONAL PAPER No. 8
FAIRCHILD TROPICAL
GARDEN

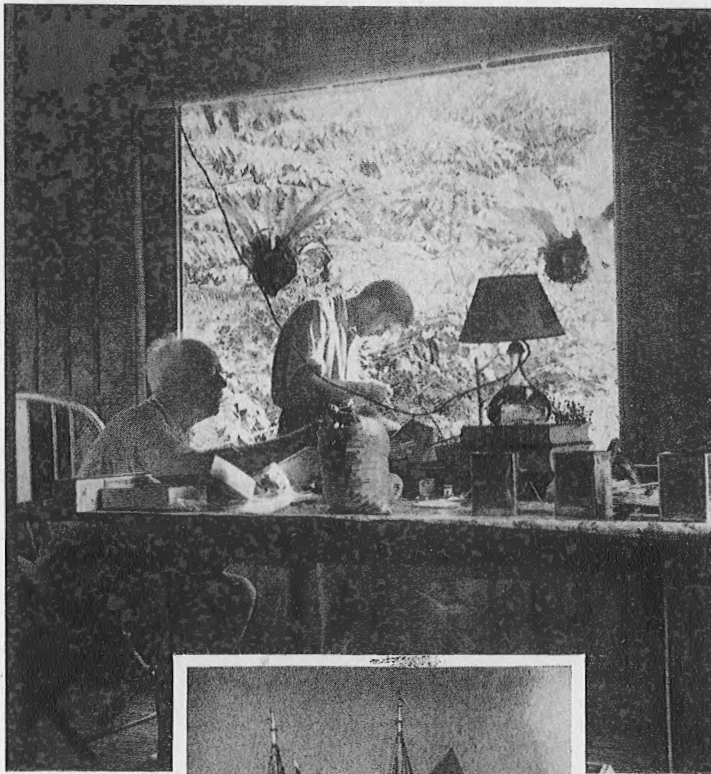
LETTERS FROM THE PHILIPPINES

By

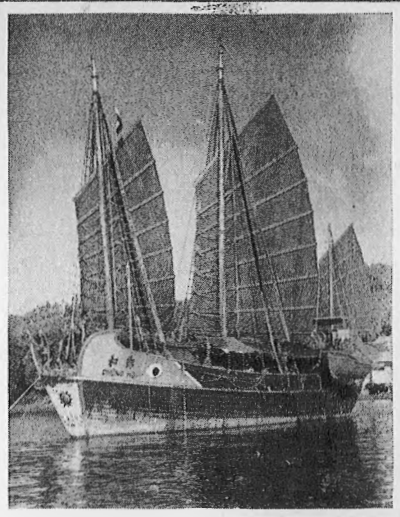
DAVID FAIRCHILD

COCONUT GROVE, FLORIDA

April 1, 1940



Left—The seed packing room in the Bahay Kubo at Mt. Makiling Nat. Forest Park where most of the seeds collected in Luzon were packed, labelled and described. Hugo Curran and the author, David Fairchild are at work.



Junk Cheng Ho



Right—The veranda covered with seeds and fruits in process of being cleaned by Guillermo for shipment to Coconut Grove by air express.

FOREWORD: These letters, printed here completely or in part, have been received by the Director and members of the Fairchild Tropical Garden from its President Emeritus, Dr. David Fairchild. With Mrs. Fairchild, he has spent some months plant-exploring in the jungles of the Philippines before leaving for the Moluccas and Spice Islands on the Archbold-Fairchild Expedition for the Fairchild Tropical Garden. They have now left Manila with Mrs. Anne Archbold of Washington, D. C., the expedition's sponsor, on the junk Cheng Ho which she had built in Hong Kong as a floating laboratory. More of Dr. Fairchild's finely written observations on plant life in the South Seas will appear in subsequent Occasional Papers.

We are indebted to the National Geographic Society for the photographic enlargements reproduced herein.

I wish it were within the power of this feeble pen of mine to give the members of the Fairchild Tropical Garden some faint idea of what collecting in these virgin forests is like. To tread the leaf-carpeted floor of a Dipterocarp forest is in itself an experience to look back to. The still coolness of its shade, the endless and fascinating variety of the forms of life that compose it, the sounds, the calls of the horn bill that break the stillness, are factors in the experience.

I have knelt in great cathedrals and listened to the chant of the choir boys or the tinkle of the High Priest's little bell while my eyes counted the number of windows in the "Oriole" or the figures carved in the marble pillars but for me a Dipterocarp forest produces a far deeper feeling of religious veneration, and gives me a sense of beauty that is infinitely greater. There is nowhere a single sign of the work of man's hands. Nowhere does a sense of lack of proportion anywhere in the scene confront me in its vastness. Its incomparable variety thrills me as nothing I see in the haunts of man is able to. I wandered on Sunday morning here in the province of Camarines Sur in such a forest. The experience will remain always in my memory. Mr. Sulit the Philippine botanist was with me and our eyes wandered constantly from side to side of the narrow footpath searching for fruits or seeds, for palms of any kind especially. The Spiny Calamus palms had no fruits, but even so were attractive with their splendid plumes. I have seen them planted in beds and without trees to climb and they are fascinatingly interesting. Of course one has to keep away from their swinging leaf tips or get one's clothes torn to pieces. *Calamus ornatus* has most decorative fruits, brown, scaly affairs that any flower arrangement woman would rave over. Suddenly on the path I saw some fruits the size of golf balls. They were black with mould and soft and unattractive. They had fallen from a tall climbing *Ficus* vine and by peering up into the tree tops I could see a lot of them silhouetted against the sky. To get them would have required a trained monkey or a half hours work with an axe. Those on the ground appeared to have seeds as I peered at them with my lens so I took them. Later I had occasion to see fresh

fruits of this *Ficus megacarpa* and to take a few thousand seeds from them for the air post.

Suddenly I heard a yell from Sulit, "Palindan," "Palindan." He had spied back from the path a tall palm of *Orania palindan* and was cutting his way to it through the jungle. I followed. There was the handsome palm 40 feet high with leaves as splendid as those of a coconut, each having a base even larger than most coconut leaves have. Instead of the usual bunch of coconuts there was a big cluster of fruits the size of golf balls born on a large branching inflorescence. The palm was perfectly straight, with no tendency towards swelling at the base. I knew we wanted seeds of this.

It was our only chance perhaps to get them. We had traveled days by auto, rail and boat to reach this place and had been given for the day the use of a logging railroad-gasoline-motor to take us back deep into the forest. I had a feeling that never again would I stand almost within reach of the fruits of this palm. I saw in my imagination seedlings of it growing in Coconut Grove and of watching them grow up. The idea of leaving those fruits behind was unthinkable. Even so when Sulit began hacking at the trunk with his bolo (for neither he nor I could climb it and Conicosa, the tree climber, had been left behind) a feeling of curious melancholy overtook me. It was perhaps mere sentimentality. But here we were felling the only Palindan palm we had found in the dense still forest on this Sunday morning.

The crown quivered and Sulit gave the last bolo stroke and the magnificent palm crashed through the undergrowth falling flat down on the ground. (Unlike a forest tree its crown of leaves did not support its tip. The leaves broke to pieces.) I tried to photograph it as it fell but couldn't because of the small trees and faint light but I did stand over it and get the pictures necessary to show its characteristics of enlarged leaf bases and inflorescence golf ball like fruit. But the moment will remain always as an unpleasant memory even though we did gather a bag full of fruits which were cleaned by Guilielmo, the boy of the Bamboo House (The Bahay Kubo) and were packed in spagnum moss and are now enroute to the Fairchild Tropical Garden.

For hours we wandered along these trails finding above our heads at one place a brilliant

scarlet fruit of a *Sterculia*—so striking in its color and form that anybody would be delighted to have it fruiting on his place in Florida. I could not determine its name. I do not know if its seeds are edible as are those of *Sterculia foetida*. I have not seen its blooms either but I am contented that its seeds (only 3 or 4 unfortunately) are on their way to Coconut Grove.

Although the tropical sun beat down on the forest cover above us it was cool there in the shade as it usually is. No insects of any kind were about and on every side were the tall trunks of the splendid forest trees, each species with its characteristic bark.

Hugo Curran had discovered an amazing thing! He came up the track jubilant over his discovery. And nobody knows with certainty yet what it is. We have called it in our notes that have gone with the seeds *Freydenetia* but I suspect it will turn out to belong to another genus of Pandanaceae. Its immense grey-green flower cluster two feet long and its yellow berries will perhaps put it in the genus *Sarranga* but as Merrill told us before I left, "The order of Pandanaceae needs a lot of work done on it and you will find many fine forms in the Philippines." Anyhow I stood Hugh up against a tree with his find in his hands and have a photograph of its long slender, dark green leaf and its immense cluster of grey green flowers and young fruits. Some day may some of the thousand or so seeds grow into pretty plants perhaps down near the sea somewhere in south Florida.

November 27th

Of the hundred species of plants how can words convey any idea of them? There are tall—very tall—palms one with indigo blue fruits, others with scarlet fruits and graceful plumes of foliage. There is a climbing fig with fruits like a golf ball but rusty brown red. Then there is a new *Eugenia* with delicious sour fruits. There are a score of screw pines, pandans, never before introduced into Florida, with scarlet fruits and one with handsome pink "flowers." There are great climbing aroids from wet lands that grow 15 feet tall, imagine it!

There are the climbing *Freydenetias*, relatives of the pandans, which scramble up tree trunks and blooms and fruit in the branches and there

is the Oriental Mangrove representative, *Rhizophora mucronata*, which if it grows will interest botanists although it looks much like our *R. mangle*. They are not a circumstance to what we expect to get as time passes for believe it or not, there are more species of trees on Makiling Volcano where the "Bahay Kubo" stands than there are in the whole of the U. S. It is bewildering to look at them, great towering things, each with different flowers and fruits, each known by a different Tagalog name and each a possible asset for Florida gardens. The *Pongamia pinnata*, the *Leucaena glauca*, the *Premna odorata*, *Albizia lebbekoides* and several handsome *Ficus* species have done very well with us and many more deserve to be tried.

We are the guests of the Director of the Bureau of Forestry, Dean Florencia Tamesis, here in this new bamboo house which has never before been occupied. He loves plants as few foresters do. I mean house plants and palms in particular. Beside the steps to the charming house stand specimens of a new and most decorative shade loving palm, *Pinanga maculata* which has not yet made its debut in the horticultural world but when it does will create a sensation, I predict. Immense orchids of *Vandopsis* decorate the lawn in front of my window here and as I look out I can see a giant aroid with cut leaves and a decorative habit which would strike our garden clubs with an awe that would almost put them to bed. It is *Alocasia portei* and I shall get some propagating material for trial in Florida.

But standing against the wall outside is the petiole of another giant aroid, a close relative of the one which forms the frontispiece of "The World was my Garden." It is fifteen feet long and four inches through at its base. Its leaf blade which I had to cut off is taller than I am and four feet across. I once boasted about the *Cyrtospermum senegalensis* which I collected in the Cameroon and which is growing at the Solead Garden and appears in the book as I have said. Dr. Merrill heard me and remarked "Fairchild, while getting a big aroid why didn't you get the biggest? "It is *Cyrtospermum merkusii* and it grows in the Philippines." I put the name down in my little red note book but forgot just where Merrill said it was until Sunday last as we were lunching on a gray volcanic sand beach at Puerto Real. I walked back from

the beach and discovered myself in an "aroid forest" so to say, for on all sides of me rose leaves whose gigantic leaf blades towered above my head. I tried to clasp their petioles of dark fascinating green but my hand could not reach around them. I then realized I was in a clump of the largest of all the giant aroids. It was an amazing sight, one I shall never forget.

I have claimed and I now claim again that after once getting a real taste of the beauties of the palms one should journey to the lands where they tower into the sky and enjoy the indescribable sensations which they create in the soul and try to learn something from the amazing variety of forms of life which still wait for human eyes to see and appreciate.

From this Bahay Kubo a hundred species peer in at the windows and these are only the fringe of three thousand species of forest trees which compose the cover of foliage of this wonderful National Park with its ten thousand acres set aside for a preserve.

*Bahay Kubo on the edge of the forest of
Mount Makiling, Laguna, Luzon.
December 19th, 1939.*

I have gotten up at the screech of dawn and opened the shutters of this Bamboo Bird Cage under the great Malay papaya tree to see what the typhoon has done to it and to the great orchids which sit in tin cans on the ground below. To spend two nights in a hut thatched with Nipa palm leaves and hear the rain come down in torrents making a steady rattle on the thatch is to be conscious of what the environment of primitive man was during the long period of his life among the palms and before he learned to build something more substantial than palm shelters.

As I look out of the large square window I see everywhere signs of the storm, not worthy the name typhoon perhaps but a real storm. It is remarkable though how little the bamboo is affected. Its great yellow shoot keeps on shooting skyward just as if nothing had happened. The beautiful fern baskets hanging at the windows were not blown down. The gigantic *Alocasia portei* which Ling the gardener is this minute fussing about and which towers above his head, seems unhurt and the gay leaved foliage plants

such as Crotons and Acalyphas (for, alas, these have disfigured the garden here as they do in Florida) really appear to have enjoyed the storm. Here comes the sun and soon the only reminder of the two days storm will be the roar of the mountain torrent in the gorge behind us. This should be by rights the last of the typhoons this season. They usually stop in November we understand.

However, it is about the last trip through Luzon that I wanted to write you. A diary of it would fill a volume and like some botanical descriptions of a plant fail utterly to give you any picture of the things themselves. I shall content myself with a very few glimpses.

We had no sooner landed in Manila than our acquaintances told us to go up to Baguio, that Baguio was *the* place of places here. Being here for palms we postponed going up into the pines. On the Kampong I have growing the Benguet pine (*Pinus insularis*) so I imagined I was somewhat acquainted with it. True, my specimen is only two feet high even if it is twelve years old.

We drove out across the plains where the happy harvesters were gathering the rice heads and flirting with each other in the golden light which seems to hang over ripening grain fields,

Through villages where the houses were almost all like this Kubo built of woven bamboo and thatched with Nipa palm leaves, we wandered in the car talking of what charming things these doll houses, which a dozen men can lift on their shoulders and carry away, would be in Coconut Grove, and stopping to discuss with one of the manufacturers how we could import the walls of these houses which he weaves from the thin walled bamboo called Boho (*Schizostachyum Lumampao*) and sells for \$9 for a roll of 100 square meters.

Up over the winding roads that lead to the mountain town of Baguio we drove and just as evening overtook us we found ourselves at the charming home of Mrs. George Fairchild—the home of one of the greatest woman gardeners of the whole tropical zone. And what a place! Its great plate glass windows look out through tall brown barked trees of the Benguet pine and these frame some of the finest mountain scenery of the island of Luzon. Out across the mountains which today are the sites of gold mines, where, beneath the rocky mountain sides, deep down in them, nearly 20,000 Igarots and other of

the Philippine population spend their days at rock mining for the stamping mills.

Of Baguio as a modern American town I shall say nothing for it is well known in America and stands in many peoples' minds for the Philippines I fear, even though its spotlessness and activity did make me a bit homesick for the cleanliness and brilliancy of the "American civilization."

It would be surprising to me if many Florida women have seen such a thing as a real terrace garden such as Mrs. Fairchild's, perched as it is far up the mountain slope and extending so far down its side that it would make them dizzy to even look down the flight of steps which leads to it and which Mother Fairchild climbs up and down many times a day to examine with her Igarot gardener, the masses of *Agapanthus* and *Calla lilies* and the long terraces filled with native orchids, bedded in masses of moss which compose this amazing flower garden of the Fairchilds'.

I say compose it, but I would not convey the idea that these spectacular flowers dominate even the hundreds of species which are everywhere about. *Bignonia magnifica* over the dining room, *Bougainvilleas* with trunks two feet through forming arbors, the flame vine in flower below the living room and wherever one looks, orchids of the rare species applied to the trunks of the pine trees. Down the terraces a ways is her large orchid house, an arbor with hundreds of the orchids suspended in the usual way but alas few were in bloom when we were there. Step after step, like a gigantic broad stairway her terraces sweep downward almost out of sight and their dark brown soil which would make any Floridian envious because of its apparent fertility, is dotted with the new plantings of carnations and tuberoses and dahlias and *Chrysanthemums* which are being grown for the flower shop which Mother Fairchild has started in order to help make the Manila residents more conscious of the beauty of flowers in their homes.

And as you laboriously descend these terraces, which are not more than a few feet wide and seem ideal places in which plants can be grown because of the drainage and the ease with which they can be irrigated, you wonder why it is that nowhere within the confines of the United States or Canada have the gardeners made ter-

aces like these, or any terraces worth the name.

Those of Aetna and the Canary Islands and the Balearic Islands and Java all seem a bit amateurish beside these built by the Igarots of Bantoc and Banaue who are past masters of the art.

It was enroute to see these terraces that we had come to Baguio but the weather was rainy and so cold that we enjoyed the hot water bottles and the quilts with which Mother Fairchild had provided the beds and the open fire made us gather round it as the rain came down in torrents as it does during the fall and summer months so often. I felt like a very poor sport when I watched from the windows the Igarot gardeners at work in the rain all day long stooping and weeding and sweeping the leaves etc., but I noticed that every one of them had on a wonderful rain mantle made of the leaf of the *Anahau* palm (*Livistona rotundifolia*) and that this stuck out behind as they stooped and covered their hinder parts well as they bent over. I have one which I bought for a song from a man on the road which will grace the walls of the Palm Products Museum some day. There are various kinds of these and I hope that the Palm Museum will become a center for their display.

Finally the sun shone on Mother Fairchild's terraces and the handsome trees of the Goa Cedar (*Cupressus lusitancia*) and the pretty pink foliage of a native *Vaccinium* tree (*V. cumingianum*) and the blue flowers of the *Agapanthus*, not to mention the bracing air of the mountains, made me almost decide to stop thinking of the coastal region of my beloved Florida and settle right down here.

But the terraces! How in the name of heaven were they made?

It happened that the Municipality was building terraces in front of its new building in Baguio and with cameras in hand Beckwith whose cousin, Cameron Forbes, was the great pioneer of this mountain town, and I went to see how the terracing was done. The workers were real experts, Igarots from Kiangnan, and the sight was amazing to us. Instead of making a dirt terrace and then walling its upright sides, they laid the walls in ditches and built them up gradually against solid dirt which overhung those ditches in a way which baffles my power of word description.

Next day, Mr. Tamesis and his Botanist, Mr. Sulit, and the Expert Tree climber, Conicosa, arrived with the official cars of the Forestry Bureau.

Marian and I thought we had done all sorts of mountain switch back trails in Morocco and Sumatra and Java, not to mention the sweeping ones over the great Smoky and Shenandoah National Park but those to Bontoc and Benaue and through the Cervantes Valley and the one to Legangilang in the mountains back of Vigan on the West coast of this island of Luzon eclipsed in the sensations they gave us, all of these. For it is one thing to swing up one of the National Forest roads and stop where it says "View" and quite another to have the car's front wheel graze the edge of a road and find you are looking down 2000 feet into a tangled mass of green tree ferns, rattan palms, tree tops and giant lianas that make a wall reaching to what you know would be eternity if anything happened.

The game of hunting plants from a newly made road is exciting. You sit and move your head continually from side to side in order to catch some bit of color or form in the masses of vegetation through which you travel that reveals the presence of seeds or fruits or flowers. "Stop, Stop" someone calls and everyone piles out and if the plant is near enough gathers it for examination. If down the steep slope, it is a job for little Conicosa who is about the most fearless little fellow that I have ever seen, not hesitating a minute to scramble down among the creepers or out along lianas over a precipice in order to gather the desired specimen. If the tree is too far down the precipice he is let down with a rope and hauled up again with his seeds.

This was not our first time together with Mr. Tamesis, the Director of Forests, so we were soon at work as we sped along towards Bantoc, the center of the Igarot civilization.

I cannot refrain from gloating a bit over the seeds of a pretty palm new to the gardens there which is a charming *Pinanga* that I happened to see out of my reach down among the lianas and which Conicosa secured. I think it is *Woodiana* but it has not yet been determined. And two *Raphidophoras*, relatives of the *Monstera* that should some day grace our patios there; and *Aralia bipinnata*, which seems to me far prettier than *Aralia spinosa* and may be so in Florida. Of the *Vitex trifolia* (var. *ovata*) which we got

later on the sand dunes of Paoay after we came down from the mountains I hope to see someday when it spreads over our own sandy sea coast; and of the pretty scarlet fruited *Tricosanthes* which Marian discovered hidden in the dense vegetation of the forest and which it took Conicosa to secure, I expect to see clusters in the Flower Arrangements of the garden clubs sometime or other.

I had asked Dr. Merrill and many others why we could not grow the *Nepenthes* or climbing pitcher plants in Florida and nobody seemed to know. I was looking for the plant in some tree or other but when on the bare clay bank of a cut in the mountains I saw here and there splendid specimens of *Nepenthes alata* I could not believe my eyes. For if the plant can grow on hills which in the dry season are so dry that the soil cracks open, then why cannot we grow them on our oak trees, or at least find places out of doors where they will be as happy as here at rather low altitudes on the clay banks. So when Mr. Sulit brought me a great spray of the brown pods and dusted thousands of long brown seeds from it I felt that the trip to the Philippines was already almost worth while, even though there is, as every plant person knows, many a slip twixt the cup and the lip.

But the terraces of Bontoc and Benaue! Words fail. That a hundred terraces, one above the other, should have been built, or perhaps "sculptured" is the word, out of the mountain sides of a great valley from the stream below up into the clouds above struck me as perfectly amazing. As we came over the divide the Benaue Valley burst into view.

Women on ladders were weeding the walls of certain terraces made of soil only. Men on ladders carrying rocks weighing fifty pounds were climbing up and depositing them on the partly finished edges of others, the rock terraces. In the distance men and women were walking along the narrow trails between the maze of terraces and here and there a worker was weeding in the mud of the rice fields with which most of the terraces are covered. For it is a striking fact that these masterpieces of engineering have been built for the culture of only two crops, viz. rice and sweet potatoes. Like those tiny little terraces in the Balearics or in Sicily they are used for the cultivation of crops which we in America grow by the thousands of acres using tractors

and planting and harvesting machinery to do the work.

I would like to tell my Florida friends that already the Avocado is coming onto these terraces, just as it came centuries ago onto the edges of those of the Mayas and that the Chayote has, since the Americans came to the Philippines, become a popular vegetable. For the Philipinos are even quicker I would say, to take up new vegetables, than are the Americans even with the surprising array of delicacies which they have already.

On Board, Junk Yacht Cheng Ho,
January 6, 1940.

Yesterday at luncheon we looked up and there was the Junk making for the breakwater. She had only been four and a half days out from Hong Kong and the weather had not been very good either so we could scarcely believe our eyes. Everybody who knows boats seems much interested in her and approves of her build and her performance between Hong Kong and here, which has tested the Diesel engines out and proved the seaworthiness of the craft and the trustworthiness of the crew. As we stood on her deck looking her over, Admiral Hart in his superb launch from the Flag Ship, stopped and came on board and told us that he considered everything safe for our projected cruise in the Dutch East Indies. So in a few days now we shall be off on the real expedition of which our stay in Luzon has been just a preliminary affair.

Tomorrow we shall take aboard all of the photographic materials and the books for the little laboratory which I hope is to be my working home for the next six months. It is a dear little place, all windows to give plenty of light amidships where the motion will be less and where I can pack up seeds and study the literature about them in a satisfactory way. Hugo Curran, the botanical collector, is on hand ready to be off, too, and we have a pair of climbing irons for him to scale tall trees with. Fenton Kilkenny, too, will help in this work.

Our plan now is to make Menado our next headquarters and have mail sent down there from Manila. The doctor of the Health Service, Dr. Howard Smith, an old veteran in the islands, is taking a keen interest in the medicines we

shall carry and we are hoping to have the luck of not needing them.

I cannot yet believe that this great experiment is really coming off. I feel so sure that there are many things for us in Celebes, Ternate, Batchian Island, Halmaheira and Ceram, that unless something blows up inside of one of us we shall get to those islands and secure some fine plants for South Florida.

In Front of the Village
of Tidore in Tahoena Bay,
Sangi Island.

January 30, 1940.

It is a rainy morning. The rainclouds hang so low on the volcano and the hills about it that they almost reach the still waters of the bay. Coconut plantations clothe the shores and far up the slopes. It is early and the crew is just stirring—the Chinese crew, I mean. I can hear them preparing their chow on the little pottery stove here on deck forward. The swaying of the boat makes the water swish onto the deck with each swing and it pours down like the water from a rain spout. Now the boys begin washing the deck with their brooms. Sam comes and asks if he can put up off the wet deck onto the hatch an immense flower cluster of a plant that was named years ago after a Dutch friend of mine, Prof. Boerlage of Buitenzorg. A little boy brought it in his small outrigger from somewhere in the forest and sold it to me for a box of matches. It ranks as one of the strangest flower clusters in the world for it produces great masses of infertile fruits that look just like fruits but which do not develop any mature embryos. These are supposed to attract the great doves and they come to get them and as they light on the immense head of flowers their wings brush against dozens of upright orange colored flowers which stick up above the level of the aborted fruits which the doves are greedy for, the pollen in great masses is left on the under feathers of their wings. When they fly to some other great flower head they carry the pollen and cross fertilize it. Oh, if only we can get some ripe seeds of this Boerlagiodendron! So far none here seem to be ripe. There are many species in the Moluccas so we shall get the seeds eventually and then some day somebody will flower it in

Coconut Grove and give a party, for it is about the showiest tree when in bloom that I have yet seen here. Perhaps the F. T. G. will be the first to flower it.

But back to the boat. The deck is loaded with flower clusters of all sorts, brought to us yesterday by a great crowd of men, women, boys and girls. They all came off in their gracefully fashioned canoes with bamboo poles lashed to them as outriggers and a more jovial laughing merry lot of folks I never saw in my life. To bargain with them was a circus for small change gave out and I had to resort to boxes of cheap matches. To tell some smiling expectant little chap that I already had the kind of seed he wanted me to buy I found a bit difficult, but a box of matches costing 1½¢ made his face lighten up with pleasure for he knew that he had often to bring a burning ember from the fire with which to light his father's cigarette.

Let me give some idea, if I can, of the variety of plants and seeds which came pouring in on us from the shore, each in its little prau with two brown boys paddling it. The representative of the Rajah of Manganito came bearing a section of a palm stem from which hung great clusters of handsome fruits and flowers; a species of Pinanga different from any that we had seen, Hugo and I, in the Philippines. But alas the seeds were not ripe and it was not until later that a little boy brought the seeds of it in a paper cornucopia, unmistakably the same species. But with this palm the Rajah sent a fruit cluster of another and a quite amazing palm, its fruits being as large as a lemon; but alas green. It took a forenoon on land to chase down this new large fruited Areca with Hugo and a gang of boys of the village. I put a specimen of the green fruit the Rajah had sent together with fruits of the Pinanga palm and a single tree snail, in a cellophane envelope and took them on land and in my poor Malay explained that we wanted seeds "massak", which means ripe, of both the palms and specimens of the snails which climb the trees in the forest. I explained my wants to a man in a little shop and he seemed to know where the big fruited palm grew and accompanied us to a tiny little village called Tidore and there, back of a pretty little house, raising its crown into the air so that we could see it against the clouds of the overcast sky, stood this graceful slender palm with its cluster

of large fruits that were as large as duck's eggs. But there was not a single ripe fruit visible and we could not tell what color the fruits would be when they did ripen. Were there other palms like it anywhere? As I asked "di mana lagi?" a little boy picked up a brilliant red fruit from the little stream which flowed through the Kampong. It was unmistakably the fruit of this palm and I shall never forget the thrill I got as he handed me the superb red fruit and in my imagination I saw a specimen of this palm fruiting in the Fairchild Tropical Garden or in someone's patio in Coconut Grove.

Further on we found enough fruits and seeds to satisfy us and after studying and photographing the fruits in the hands of a smiling old man who had a whole handful of them, for it was in his yard that the trees were growing, we traveled on, Hugo and I, up the mountain side to see the Sago Barok, a certain spineless species that we have not yet determined. At last above us the man who was guiding us pointed out a tall palm in bloom, its drooping clusters of young fruits seeming at this distance perhaps a foot or so long. After some bargaining the man took Hugo up the mountain side and I sat down to talk with the head man of the village and learned of the visitation of a scale insect to the island years ago which had devastated the coconut trees, making their leaves turn brown and of how the experts from the Dutch Government have introduced some other insect that had completely parasitized this pest. My Malay was not good enough to discover what the parasite was but I shall find out in Menado where we go in a day or so.

As I sat talking to the men I heard a crash and knew that Hugo and his guide had felled the "Sago Barok" palm, then a rattling noise and Hugo appeared with the gigantic palm top on his shoulder. He looked like a giant beside his guide who trailed him, dragging the eight-foot cluster of green fruits along the ground. Stopping there in the neatly swept dooryard we took a photograph of its superb foliage and gigantic fruit cluster for the collection of the Museum of the F. T. G.

But as we tarried there a man appeared with a beautiful bamboo basket which was loaded high with Ramboetans, those gorgeous red fruits like giant red chestnut burs which the Western Hemisphere, strangely enough, has not known

until recently and which Popenoe established in Honduras from seeds we sent him in 1926. They are like lichees, juicy, delicious things, but with fruit flesh that clings to the large seed. While eating some of them my attention was attracted to some Durians in the basket below. "Brapa?" I asked, and the market man came back with "Satu rupie". Fifty-four American cents for forty ramboetans and a half dozen durians. Since I questioned the ripeness of the durian the market man broke one open with his hands and showed me the whitish yellow fruit pulp. I smelled it and recoiled from its "fragrance" much to the amusement of the crowd. I found, however, that everyone in the crowd was crazy about the durian and as soon as they could, snatched pieces of the fruit away from its owner and gobbled them down with as much evident delight as would a picanniny, pieces of his favorite watermelon. We brought two beautiful specimens on board but after a time Mrs. Archbold demanded of the Chinese crew that it must eat them at once or throw them overboard. So do the tastes of people differ. Even our Hollander, Daan Hubrecht, who loves fromage de Brie and Camembert and perhaps even Limburger, recoils before a ripe durian. I have decided that it is a cultivated taste, in the same category with the taste for "high" game and highly flavored cheeses.

Loaded down with specimens of palms and seeds and with a very pretty white flowered labiate, worthy of our gardens, Hugo and I made our way to the beach and in one of the tiny outrigger praus were paddled back to the boat. I was conscious of a kind of drunkenness which comes to me often when I have seen a host of new plant forms and spent hours gazing at them. Galleries of paintings tire me after an hour or two but close up views of tropical vegetation dripping with rain or bathed in mists give me a kind of intoxication that no museum or art gallery can give.

I had an idea that a siesta was in order after lunch. Everybody takes one here. But no sooner was lunch over than the crowd at the gang ladder became so insistent that I had to meet it and spend the rest of the day, until late into the evening, bargaining for fruits and flowers and palm and bamboo baskets while the ladies handled the sellers of native fabrics, such as soft woven mats of Pandan on which in this

climate it is a delight to sleep and which have such colors as one associates with mats or rugs made by artists—not of glaring colors such as one sees so often in America. Travellers to the tropics on great ocean liners have become familiar with the delights of bargaining for objects brought on board but I doubt if any of them have much idea of the fun we have had with these jolly people bargaining for seeds and plants and snails and other natural objects.

Just this minute Mrs. Fairchild is taking the remains of some snails out of their shells and a boy has brought a beautiful parrot-fish and Hugo and Captain Kilkenny are cleaning the seeds from some red-black Pinanga palm seeds, staining their hands deep red in the process. Mrs. Archbold is arranging for a show of pictures to the school on shore and Beckwith is developing the last roll of films which Hugo and I exposed, while Fant is arranging some slats to keep my books from pitching out of their places on the shelves when we again put out to sea from this harbor. While it should be calm and sheltered in this tiny cove, the winds coming down from the mountains have blown us about so that one of the anchor wires, an inch through, was snapped yesterday, leaving an anchor somewhere in the dark, volcanic sand of the sea bottom. Those familiar with boating in the shallow waters of the Caribbean can hardly realize that here the anchorages are really deep and that forty fathoms is not at all uncommon even within a stone's throw of the shore. I must interrupt this letter now for the rain has let up and Hugo and Daan Hubrecht and I must go ashore and see if we can buy the tall palm that bears the large red fruit; the species of Areca—so that we can get good photographs of all its parts.

* * * * *

Well, we went ashore in the launch. The rollers were so high that we had to hunt a spot along the coast where we could land without getting soaked. The head man of the village, dressed in white duck coat and sarong, met us and Daan explained that we wanted to see a specimen of the "Kavesu" palm which we found out was the Areca palm that we discovered the day before. It began to drizzle and then to pour and I hugged my camera close under my rain coat to keep it dry as we waded through the mud and

wet grass of the village, followed by the owner of a Kavesu palm and a lot of little boys to whom the rain meant nothing whatever for it was only warm rain-water and it rolled off of their brown skins like water off a duck's back. I hated the idea of cutting down so handsome a palm right in the yard of a pleasant mannered man and his wife, but the owners seemed to have no special interest in it, for its fruit was not good to eat, neither was its bud used for salad and a rupee was worth more to them than the palm. As the rain continued, Daan and I sat under the thatched porch of the little house and Hugo superintended the felling of the palm. When it fell I ran out and with an umbrella held over me took a number of photographs in the rain.

It was a rather dreary experience I must confess, for I hate rain and I loathe mud and we had had an hour of paddling about in the rain, stepping in mud puddles every few steps. I recalled the days in Coconut Grove when the rain came down in torrents without making a single real mud puddle and it made me hate mud worse and worse.

With the specimens of the leaves rolled up in the handsome long green leaf sheaths we set out for another reported palm, a Pinanga, seeds of which we had secured from the Rajah's friends. This meant another walk in the rain through the mud and a wait for a bamboo ladder with which to get high enough up the small palm to take off a leaf or two for our herbarium. The rain continued as we reached the beach where the outriggers were hauled up on the shore in anticipation of a storm which seemed approaching. One large prau had just returned with its nets and brilliant colored fishes the size of small perch and the owners offered to take us on board, so with our palm specimens we three boarded the prau and with the ease that characterizes the native handling of these ideal canoes we shot through the surf without shipping a drop of water and were soon crawling up the gangway like three drowned rats. To drop off one's muddy clothes and sit down to a luncheon on the Cheng Ho, whose cook is an accomplished Chinese chef, is a luxury that nobody could fail to appreciate, especially when a cozy little work room on deck with windows on all sides and shallow drawered cabinets and writing desk invite one to study one's finds and determine them

if possible from the little library of scientific books on the shelves.

Tomorrow at four in the morning we shall pull out of this harbor and move on southward to another little one on this same island and after a day or so there, go farther and call on the Radja of Siao Island where there are roads and an automobile or two. Here there is not a single automobile nor a carriage of any kind; not an electric light, either, and yet the eighty thousand people seem very happy and contented and live in pretty little houses of bamboo, thatched with the Sago palm leaves. But, there are mango-steens galore everywhere and Ramboetans, too, and the famous Doekoe and who could be unhappy with such fruits to eat?

* * * * *

Bai van Dago, on Sangi Island.
February 1, 1940.

The anchor is up and we are leaving the charming bay of Dago behind. Mrs. Fairchild and I are saying to each other that there is something very sad about the thought that never again will we set eyes on this beautiful spot in which we have spent delightful hours collecting on shore and from the launch. As a parting shot I photographed a dear old man and his wife and two children who had come out in their prau with a rooster and a hen perched on the fish spears which are held in a rack above the outrigger. Nothing could be more delightful than the water life of these people. Their knife-edged praus with bamboo outriggers are the means of transportation of all and the tiny children seem as fearless in them as though they would never upset. And even if they do, the boys simply hang on to them, right them, bale the water out of them with their hands and crawl back in again. Coming down the tidal mangrove lined river here this morning in the launch we saw two women with a bunch of bananas on the bow of their prau and we followed them to offer to buy their bananas but they were frightened and paddled for dear life and escaped up a stream. They must have thought we were a terrible, white hatted, noisy gang.

Two experiences will stand out in my memory of the Bai van Dago; the first morning with Mrs. Archbold and Fenton in the launch, coasting slowly along the rocky cliffs of the shore, hunting for plants which will stand the salt

spray and, being able to grow within a few feet of the surf which should be able to stand any of the salt laden winds which sweep across Miami Beach and Nassau. We found several things; orchids of course and the large brilliant red flowered *Ixora macrothrysa* which will appear in our photographic album in the hands of a native of the place who had to be coaxed and cajoled into holding it for us to take. But these may all be old. However, we saw on the rocks, covering them with a mat of grey-green roundish leaves, a very pretty plant entirely new to us. It bore purple flowers reminding us remotely of the Saint Paulia. That so delicate a flower could grow so close to the salt water seemed amazing and Fenton scrambled up the cliffs and got some seed which we hope will reach Florida alive. Overhanging the water Mrs. Archbold saw against the light green of its leaves a cluster of scarlet fruits, a dozen of them or more. They were the opening pods of a very handsome *Sterculia*; pods of that striking shade of scarlet that one associates with lacquer and that does not tire the eye to look at. Should the seeds we are now taking out of the pods grow into trees in Coconut Grove they will cause a sensation when they flower just as *Sterculia foetida* does when its beautiful red pods open to show its dull black seeds.

The second memory of Dago is of the later afternoon; Hugo, who had been ranging the hills, had discovered a new variety of Areca with yellow fruits instead of red and a beautiful golden yellow variety of the bamboo *Schizostachyum*, (something he had never seen in the Philippines and of course I had never seen in Florida). He proposed even though it was late afternoon and had begun to drizzle that we go after these in earnest with the launch. The tide had fallen and we had to wade ashore. Soon a crowd of boys and girls and, later, grown men and women gathered on the old jetty to see us. They were a laughing, jolly, delightful lot and responded to my poor Malay of "Di mana bigi di bua ("Where are seeds of this tree?") by scrambling up the trees for seeds of a tree with a beautiful large white flower which seemed as though it should grace the patios of South Florida. Soon the Capella Kampong; the head man of the village, appeared and very gravely introduced himself and his secretary to me and showed me into his "Kantor" or office where,

since it had commenced to rain, I stayed while Hugo went after his golden bamboo which the Capella said was called the "Bamboe nipis koe-ning" or King bamboo.

As I sat there trying to recall some of my forgotten Malay there came back to me an incident regarding the papaya that has for over 20 years lain—(* * * break; for Marian just now whispers in my ear "We are approaching a smoking volcano that rises right out of the sea and you must come out and see it." "How can one write when there are such interruptions every minute?" I retort but I do go out and see the volcano. It is 5,800 feet tall and after all, if the tiny little thing were transportable to South Florida it would not only "stop the traffic" on Biscayne Boulevard but completely change the climate of Florida, make it a rainier place no doubt. Its cone is almost a perfect one and from the top pours a column of smoke like the one that pours from Vesuvius; only this volcano that perhaps no American even heard of, is almost twice as high as Vesuvius. We are going straight towards this smoking volcano and in the drawer of my desk here, is a letter of introduction in Malay to the Sultan of Siaoce from the Netherlands Controleur of the Island of Sangi. All volcanos are much alike when seen from the sea; they have nothing approaching the novelty of the forms of the plants we are seeing around here. I shall try to prove this as soon as Marian and Mrs. Archbold and the boat-minded men have been satisfied that I do have curiosity enough to see their volcano)—fallow in my brain. I read in a book by Koorders twenty-five years ago that in the island of Celebes the natives ate the leaves of the Papaya and fed the fruits to the pigs. I never believed this story and when I came to Florida and began growing papayas, Marian and I tried the young leaves of the papayas in our yard. We cooked them and finding them bitter changed the water on them three times and then they were perfectly delicious. I told of our experiment to the great analytic chemist, Dr. Powers, and he said I had better let him analyze some leaves. He called me to his laboratory later and showed me a test tube half filled with the white crystals of Karpaein which he had gotten from the leaves I gave him. Now Karpaein, like digitalis, is a very strong heart stimulant and used in excess is a deadly poison. "How did you escape?" Powers

asked. "By changing the water three times, I suppose," I said. I remembered all this as I sat in the little palm thatched Kantor in the tiny village of 200 inhabitants most of whom were in the street looking at the strange human who had landed from a Chinese Junk in the bay outside. Here I was with papayas all about me. Did these people eat the leaves of the papaya? I started in to find out and was surprised to discover that enough Malay came back to me to get the information I had wanted for twenty-odd years and get it from the Capella Kampong and his assistant. Yes, the leaves were eaten by everybody. They were cooked and formed a part of the so-called "sayor", that is the vegetable part of the Rijs tafel. They were only cooked ten minutes and the fresh leaves were not considered dangerous at all but they were, the Capella Kampong told me, very bitter and I tasted them in his presence and they certainly are very bitter. For karpaein as I knew is extremely bitter. Hugo tells me the monkeys eat the leaves in large quantities in Manila and survive. So at last by making this journey direct to the place where the papaya leaves are eaten I have satisfied myself that they are good to eat, regardless of their content of karpaein and of Dr. Powers' warning which has kept me from eating them all through the years. Isn't it strange that such a thing as the edibility of the leaves of a food plant so common as the papaya should be practically unknown although it is cultivated and its fruit highly esteemed the world over?

But darkness began to settle down and Hugo returned with clumps of the golden bamboo and then we inquired about the yellow fruited Areca that he had seen in a yard across the road. As soon as the crowd heard we wanted some seed a tiny little fellow, not over eight, scrambled like a monkey up the stem of a coconut that stood near the Areca but in trying to reach over to the fruits he lost his balance and could not recover it and there he hung between the two palms twenty feet above the ground. Perhaps it was his brother, anyway a larger boy, angered at the boy's foolhardiness, shot up the coconut palm after him and with an irritated sweep of his arm pulled the little fellow out of danger and sent him sliding down to the ground. Then he struck the fruit cluster and sent it hurtling over the fence where we could pick up the fruits and put them in our basket. In the gathering

gloom we returned to the shore and bidding the crowd good bye forever, and making the little fellow happy by giving him a box of matches which a crowd of his little friends crowded about to see, we waded through the mangroves to the waiting launch and were soon alongside the Cheng Ho with its brilliantly decorated stern and sides and the comforts of dinner and bunks.

"When do you want to go ashore tomorrow?" Mrs. Archbold inquired. Six-thirty was agreed upon and before the sun shone over the hills that shut in the Bai van Dago the launch was headed for a tidal river lined with mangroves which empties into the bay half a mile away from the Cheng Ho. We were a party of seven. Ah Fook, the boat man, Fenton who ran the engine, Hugo Curran with his bolo and collecting bags and tags, Beckwith with his wonderful camera all wrapped up in oil cloth to protect it from the rain, Marian with her equipment and Mrs. Archbold with hers, and the writer with his little camera and exposure meter hung about his neck and his collecting coat of many pockets in which he is always losing the things he wants.

It was agreed before I left Coconut Grove that since the mangrove vegetation of the Oriental tropics, although resembling that of the Western world in general appearance, is made up of quite distinct and different species of trees, it would be a very interesting thing to get seeds of these species which compose the Oriental Mangrove swamps and plant them on the shores of Biscayne Bay to see how they would compare in beauty and interest with the native species growing there now.

As we headed into the stream at low tide and I found myself surrounded on all sides with the fascinating mangrove trees with their stilt and aerial upright, breathing roots, I thought there was something lacking in the scene before me; something which I had come to associate with the mangroves of the Shark River or places in the West Indies. Where were the land crab holes and where were the thousands of crabs which so enliven the mud banks of the streams? Where, too, were the thousands of snails which live on the brown stilt roots of the *Rhizophora mangle*, our chief mangrove tree in the western hemisphere? Has the fact that this island is volcanic and that there is not so much lime as there is in the calcareous soils of Florida anything to do with it, I wonder?

As we went up the river and were able to look off into the depths of the mangrove forest on both banks I felt conscious that I had never seen before so beautiful a stand of these curious and interesting tidal trees. The trees were about forty feet tall and formed "solid stands" of this height. But there was a strange cleanness to the trees above their roots which I could not quite analyze. I realize only now as I sit down to make this comparison between the mangrove vegetation of the Orient with that of the Occident that this striking difference between the two; this neatness and tidiness of the Occidental mangrove, is due to the complete lack of any species of Bromeliads whatsoever. Those pretty red flowered Tillandsias which we search for in our mangroves were nowhere to be seen. The Shark river mangrove is a tangled mass of plants compared with this mangrove of the Bai de Dago of the Island of Sangi. Neither were there any orchids to be seen commonly in the crotches of the trees, and the only palm to be found was the Nipa palm and that only in the inner, fresher water part of the river, not at its mouth.

As we were wondering if there was light enough to photograph I saw something which I have always wished to see in the wild. I saw attached to several of the trees near the edge of the stream curious things which look as Captain Kilkenny remarked, like roasted ducks with their heads on. These fat, brown, irregular things with bunches of green leaves rising from a neck that crooked down from them and then curved upwards I recognized at once as plants of the genus *Myrmecodia*. To me who could recall the excitement which the discussion regarding these plants created when they were first studied by Treub and Beccari and the bearing in mind of the fact that they had running all through them, galleries in which myriads of vicious biting ants universally make their home, there came a great thrill in their discovery here and we moved up to the tree where they hung and began taking pictures of them at once, regardless of the vicious bites of the tiny red ants which swarmed out of the plants when we lifted them off the trees. "Not in the boat. Not here. Drown them before bringing them on board!" came from the ladies. Hugo was alternately brushing his arms and legs to rid them of ants and standing as still as he could while we got close-ups of these strangest of plants.

The literature seems divided in opinion as to whether these *Myrmecodia* represent true cases of symbiosis or not; whether the galleries which run everywhere through their swollen stems were encouraged by the ants or not, whether the plant derives anything but a slight protection from the ants, whether the ants get anything but an ideal abode from the plant; these are all questions that seem difficult to determine. In any case these strange plants of the mangrove forest, inhabited by colonies of ants appear to be a most striking example of the friendly co-operation that exists between insects and plants and this, too, in the "world of the Jungle" which to most people is a world of tooth and claw, a world of struggle for existence, a world of the survival of the fittest. As my old friend Morton Wheeler has shown, the examples of *mutual aid* are *more abundant* in this wild nature than are those of parasitism; much more so.

Up the tidal stream we paddled speaking only in whispers for fear of frightening the Hornbills overhead, until we reached the zone of Nipa palms which to my mind makes one of the most interesting features of the Oriental Mangrove swamp and which alas is yet unknown as an element of the coastal vegetation of the Western tropics. This palm is a rather slow growing one and unless you can find a place where the underground stem has been uncovered by the washing of the tides you imagine it to be a stemless palm. As a matter of fact it sometimes has a rather long stem that is hidden deep in the mud. From it arise the graceful green plumes to a height of twelve feet or so. These are crowded closely together and give a characteristic background to anything in front of them. Here and there rise its fruits and male flowers; stunning brown structures that would grace any flower arrangement because of their sculptured seed coverings and their deep dark mahogany color.

As we were admiring these beautiful Nipa palms along the mud bank on which, be it emphasized, we saw scarcely a single snail or crab, someone saw high up in the branches one of those ant's nests made entirely of green leaves which have been "sewn" together, so to say, by the big brown fierce-fighting ants which have learned to utilize the silks which certain larvae produce for the making of their cocoons. These marvelously intelligent ants take these small larvae in their mandibles and squeeze out their

sticky liquid silks and with it fasten the leaf edges together. The liquid silk, fresh from the spinarettes of the larva, is very sticky and needs only to be touched to the surface of a leaf to stick to it so that the ant can pass it to and fro from one leaf edge to the other. Some of the ants, it has been observed, hold the leaf edges together while their co-workers pass the silks containing larvae like bobbins, back and forth between the leaf edges.

Years ago, in Singapore, the discoverer of these ants, Dr. Ridley, had shown them to me; but it was thrilling to have them right before us there in the mangrove swamp and to have Hugo, who is afraid of few things in the way of insects, calmly hold the nests for us to photograph while hundreds of ants were, so to say, "eating him up." He tore one of the nests apart and I captured a number of the ants, together with some of the marvelous grey fabric which they had woven between the edges of the leaves that were far apart. I could see here and there a white larva with ant holding it in its mandibles but disturbed as the ants were, they did not do any weaving. When I returned with these specimens in my cellophane bag too many things happened on the Junk and I never returned to an observation of these, the most intelligent perhaps of all the ants of the world. Loaded down with the seeds of three species of trees which with several others compose the Oriental Mangrove vegetation we climbed on board just in time to weigh anchor for the next port, the port of Oeloe on the Island of Siaoë, our approach to whose smoking volcano which I have already referred to. These seeds are already packed away in moistened German peat moss and will be sent by Air Post from Menado in a day or so.

I confess to a certain degree of annoyance at the appearance of that volcano at that particular time on the horizon but as the moments passed and the insistent calls from the poop deck of the Cheng Ho became louder and more insistent, I abandoned these notes on my typewriter and went to see Siaoë, which appears as a tiny speck on my Atlas of the Dutch East Indies.

As the smoking cone, almost perfect in outline, like Fuji, rose higher and higher before us in the afternoon light, the furrowed slopes of the mountain came into relief. Clothed almost to the cinder cone, 5,800 feet high, with the most beautiful of the palms, the coconut, these gigan-

tic ridges swept from high up the slopes down to the sea like the folds of a bridal gown. I have approached many volcanos from the sea, Aetna, Vesuvius, Fuji, Camaroon, Stromboli, Saba, and others, but with the evening light as it was that day and the clouds as they were at the time, I have never seen anything approaching the beauty of the scene that slowly passed before my eyes as I sat on the deck of the Cheng Ho and watched the swirl of the swift ocean currents about the ship and looked off at the shadows which grew darker every moment in the deep gullies between the magnificent furrows of waving coconuts with which Gunung Api was completely covered, almost to its ash cone. I had stepped out of my little laboratory here with the idea that I would take a look and then come back and finish what I was doing but little had I counted on Gunung Api on the tiny island of Siaoë. For an hour I sat enthralled with the scene before me while all the old stories of Stevenson and Beck and Lafcadio Hearn swirled through my head and I wondered why Marian and I should not stop right here; here where the world ends; here where springs pour their fresh waters into the sea and make bathing places for the people; here where from the port hole every morning I could see the smoking cone of a volcano nearly 6,000 feet high and hear the lapping of the waves on a tropical shore; here where the mangosteens are ripe and baskets of them fill my room, here where the sea gardens must entice one to spend hours gazing into that other and fairer world, the world of the blue depths of ocean.

* * * * *

Yesterday Daan and I went with the letter of introduction to call on the King; the Rajah of Siaoë, Parengkuan. We found him in his Kantoor; a dignified, handsome man with a large, striking shaped head and a smiling intelligent face. He was courteous and considerate of my poor Malay and understood at once Daan's careful exposition of our mission to his island. We had come he understood, to gather "bigi di poehoen, roepa roepa" (seeds of various kinds of trees), and he at once took us for a tour of the village. Later, in a bus, he accompanied us in a trip around the island, up and down along the coast with its idyllic beaches lined with praus, and up high among the nutmeg plantations and

coconut palms and down again to the coast where the Sago palms grow.

As we walked and conversed in rather a halting fashion I hit quite naturally upon the topic of the edibility of the leaves of the papaya. "Of course, we eat them," he said. "They are very good indeed. We all eat them and eat them every few days. We usually cook them and serve them as greens but you can eat them raw if you do not mind their being very bitter. They cannot hurt anyone. In fact, when I feel tired I often drink the bitter water which is usually thrown away when the cook prepares the papaya leaves for the table. It is good when I feel tired. It is good when one has fever, too." By this time we had arrived near the house of the Tuan Schoolmaster, a very intelligent man and after a few words of conversation with him about the papaya leaves he invited us to come in and taste the leaves which his wife had just then cooked for his luncheon. "These are of the male papaya," he explained. "The leaves of the male plant are not so bitter as are those of the female plant," he declared. "It is my favorite 'soyer' (greens). I have it nearly every day. And, the children like it, too, when the cook does not make it too bitter,—does not fail to throw away two waters in which it is cooked."

Here I was among the papaya leaf eating people which my old friend, Koorders, of my Buitenzorg days had written about and which twenty-five years ago I had read about. The romance of the situation filled my mind. Here were people who for generations had been eating the cooked and even raw leaves of a plant which my friend, Dr. Powers, the great chemist, had discovered contain large quantities of karpaein, a drug as stimulating to the heart as digitalis. I seemed to see Dr. Powers' face as he held up his test tube half full of the white crystals of karpaein that he had gotten out of a few leaves of papaya that I had sent him from Coconut Grove. Then the strangeness of the situation dawned upon me. Here was one of the most remarkable tropical fruits in the whole world, grown from Panam to Australia and from Brazil to Southern China, and now in recent years become one of the favorite fruits of the newly inhabited region of South Florida. Volumes in the aggregate have been written about it. Its papain has become the subject of hundreds of chemical studies. The great research chemist, Bergman,

of the Rockefeller Institute, has even discovered it to be one of the most interesting of all the proteolytic enzymes known to man and one of the chemists of the Department of Agriculture in Washington has obtained the pure crystals of this remarkable enzyme and the meat packers have begun to use it as a "meat tenderer" commercially. And yet, I have had to come to this far away place, this corner of the world, to discover that it is not only the fruit of this remarkable tree which is a food but that the leaves as well form an integral part of the diet of hundreds of thousands of people who to all appearances are unusually healthy and vigorous. As I write these lines I can hear the happy voices of the crowds of children here on the shore close by. As I lay in my bunk pondering over this situation I determined to do something about it. I recalled the movie pictures which I staged once in the back yard of Mrs. Secretary Lansing during the Great War when it was thought desirable to teach people to use dried vegetables. Why not stage a picture of the Rajah and his wife eating the leaves of the papaya and get him to write me a letter stating that they are good to eat. When the Rajah came on board I laid the plan before him and he was pleased and his wife, whose laugh is the most contagious I think I have ever heard, received the proposal that we take pictures of her husband eating the leaves of the papaya, with roars of laughter. So this morning Edward and I, both armed with cameras, appeared at the door of the Rajah's handsome dwelling and there for nearly an hour kept our cameras going in an attempt to portray the Rajah and his wife in the act of eating both the raw leaf and the cooked leaf as it is used as "greens". His Highness even suggested that he be taken drinking the water poured from the greens which is of course very bitter. He said as he did so that he often took a drink of this water when he felt tired or feverish.

He seemed to grasp the full import of my mission to teach the people of Florida that the leaves of the papaya are not poisonous as eaten by the people here. The bitterness of the raw leaves here does not differ from that of the leaves in Florida, furthermore, so that it is not a question of the papayas elsewhere containing the alkaloid Karpaein and those here not having it. So I shall send this short account of an overlooked use for the papaya to my friends in

Florida where in the course of time perhaps it will have an effect of some sort. Either these people here are doing a dangerous thing by eating the leaves of the papaya or we in Florida and elsewhere are stupid in overlooking a perfectly good new vegetable which we grow in great quantities and deliberately throw away. The fact that although we served papaya greens for luncheon today and that Edward Beckwith refused to even taste it has nothing to do with the case. Like many Americans and others he does not like to taste new things. I have a very close friend who has all his life refused to learn to eat cheese of any kind whatever. I found the greens most excellent and so did Mrs. Archbold and Fenton Kilkenny, even though Ho, the cook, had not washed out as much of the bitter principle as he could have. All of the bitter can be easily washed out by three changes of water. I know this for I have done it. And so I send this little story out into the contentious world of taste. It has taken me a quarter of a century to gather the data for it and I trust it will be given sufficient publicity to reach the ears of Florida papaya growers at least.

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Approaching Menado, Northern Celebes.

February 5, 1940.

Yesterday was Sunday in the little island of Siaoe and it seemed as quiet on shore as in some American country village for the people are mostly protestant Christians and go to church. Edward Beckwith and I went in search of one of the four automobiles and it took us over the hand-made roads, so narrow that the driver could not turn around easily, up to a tiny village on the mountain side where it stopped because a rain storm had washed out the road ahead. We got out and walked down the hillside over a pretty path into a charming valley followed by a crowd of the jolliest children I ever saw. As the crowd grew larger the little girls and boys began to sing. Song after song they sang, keeping perfect time and key. The melody was suggestive of some religious song that I used to know in my childhood but the words were Malay. One tiny little girl not over five or six, threw as much enthusiasm into her singing as any artist could and impressed me immensely by her flow of spirit and her gaiety. When we

walked on they followed us, singing all the time. Had I been the Pied Piper I am sure I could not have been followed by half so jolly a crowd of children. And when I discovered that the path led through a small planting of a vegetable that was entirely new to me, the "Gedi," and I wanted to take a photograph of it the whole crowd offered to stand beside the bush. Unfortunately all but one little tot of a boy and one sweet little girl were dressed in white and as white clothes will not do anything to a photograph but spoil it, I waved them all aside and then begged the two who were dressed in reds and browns to pose for me. This selection seemed to give a distinction to these two little people that was quite tremendous. I could not help wondering if the distinction would last long and whether my little girl would seem more lovely to her beau than she had before because of it.

But the vegetable! It looked like some sort of a papaya but bore no fruits or flowers and the people told me that it never does; that they always plant cuttings of it. Down the hillside there was a boy gathering a mess of the leaves for luncheon. I tasted them and unlike the leaves of the papaya they were not in the least bitter but they were rather slimy, perhaps more so than the leaves of the Talinum which we have learned to so cook that it is delicious. I have cuttings here on board to send tomorrow from Menado for the gardeners of Coconut Grove to grow. I shall find out what it is from the experts in Menado.

Having exhausted our trail we returned to town and tried the other direction in the automobile, but a few days ago a mountain torrent had washed a hundred yards of it into the sea, so we took to the coast, walking over the boulders to the sandy beach. As we were walking along, I looked up and saw outlined against the sky, an enormous tree with a trunk four feet in diameter with scores of the characteristic white translucent fruits of *Hernandia peltata*. How the sight of them transported me back to "The Kampong" in Coconut Grove and reminded me of the strand we visited in 1926 on the tip end of Sumatra where Marian and I got the seeds from which our tree in "The Kampong" grew! This tree was really enormous. It had been blown over by a storm so that its branches almost hung over the water at high tide. When the little boy who climbed up and got me a bunch of the fruits

began to blow across one of them and made a musical note I could imagine he was my grandson, Hugh Muller, for he must have been about the same age. One of the hopes I had in walking along that beach was to find a new form of pandan, seeds of it, for the beaches of Florida, and I was not disappointed for there, back of the actual strand, stood the handsomest species so far as its leaves are concerned, I have ever seen. These leaves were over six inches wide and glossy and of a dark green color and over six feet long. The tree itself was perhaps 25 feet tall and clothed with these great leaves almost to the ground. "Suka bigi di itu" I kept repeating and the boys who were along (for there seem to be boys everywhere on this island) scurried around under the dead leaves and brought out some quite enormous seeds, each one of them with rather large sprouts attached to it. Judging from the size of the individual seeds the fruits must be something quite enormous. I fear these will not carry alive to America but I am going to try the experiment for it would be a splendid addition to the ornamental trees of South Florida if it succeeded there. I do not know its botanical name, of course.

Edward and I returned to the Junk to find that Mrs. Archbold and Marian had been off in the glass bottomed boat with the Rajah and "Rajahress" viewing the gorgeous sea gardens which lay only a stone's throw from the boat. There are few experiences more restful than that of gazing down deep into the great caverns filled with bright colored fishes and corals and imagining one an inhabitant of that quiet, almost noiseless world instead of a resident of this aerial one which nowadays has become so noisy. By the time the Cheng Ho hoisted her anchor, the noise of the children swimming and boating about the Junk and looking into the port holes had become annoying but as she left the noises of the shore behind and the smoking cone of Gunung Api and the verdure covered cone of Tamata stood out against the clouds of the late afternoon, we all agreed that we were leaving behind one of the loveliest spots on earth and one filled with the gayest, jolliest lot of children in the world. The two volcanos were on the rim of what must have been sometime an enormous crater across whose deep waters we sailed away for the great Island of Celebes, only a night's journey south of us.

As I started this account of our last day in Siaoe, dawn was breaking and ahead lay the volcanos of Celebes. Their cloud caps were lighted by the rising sun and a great rain cloud reflected its pink shades in the sea and the panorama was one of those gorgeous things which tropical sunrises at sea alone can produce. We shall soon anchor off Menado and then the real entrance to Netherlands India will commence and, after all these years of dreaming about Minahassa I shall see its charms and be able to wander through its forests, noted in the annals of both English and Dutch history as one of the most beautiful regions in the world. Now the burning question is how soon does the mail steamer leave for Macassar on the South West coast of Celebes where the air planes take off for Batavia, Singapore and America, for our collections which are here on the desk must catch that boat or wait here in this tropical climate another week. Of course the longer the sojourn in their packages in the tropics the less are the chances of the seeds living and growing when they arrive in Coconut Grove. This getting the seeds we collect off is always something of a race for time.

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Menado at last and what a disappointment! Here we are rolling about in one of those harbors where there is always a nasty swell and where anchorages are always things to be nervous about. If the outlook from the boat were pleasant the case would be different but here we are cheek by jowl to a lot of rusty corrugated iron-roofed Godowns. There are several men whose inventions, practical as they are, have always annoyed me intensely. One was the inventor of Mansard roofs and the other was the discoverer of corrugated iron, for these two men have ruined the landscapes of more places which might be pleasing and even beautiful than have any other two human beings. Then, too, no mail boat leaves this harbor until the 12th and our precious seeds must stew and wait. I say stew for this is really a hot, muggy place and we are only 1½ degrees North of the Equator.

* * * * *

Sunday Morning in Menado, Feb. 11th.

Here I am in a corner room of the Wilhelmina Hotel or rather, on the open porch in front of it, for all the Dutch hotels here in Netherlands India have open porches on which the guests live and they are a great comfort. This one is unfortunately made noisy by a near-by radio and two large dogs but fascinating by two love-making brilliant parrots and one of those great white cockatoos with yellow crests. Fruit trees such as the Governor's plum, the Langsat and a Mangosteen fill the patio and some immense orchids from New Guinea are in boxes near the Manager's quarters. We have come down from a visit to the highlands where we went for a few days and where I hoped to see what I came here to see,—the *Pigafettia* palm. The Minahassa region of the Celebes is its home and I hoped, notwithstanding the wide spread destruction of the forest here to find it somewhere. As we drove in the automobile with top down we swept the horizon with our eyes but for some time saw nothing which answered to my idea of this palm. I had only seen it in the Sibolangit Garden in North Sumatra; the specimen from which we finally secured the seeds through Walter Bangham that grew at Chapman Field and I trust are still growing there. I was looking for a medium sized palm like the one in Sumatra. "There it is," screamed Marian, often the first to spot a new thing. Rising twenty feet up through the undergrowth on the side of the road, a steep hillside, and straight as an arrow shooting for sixty or more feet skyward above it stood the first mature specimen I ever saw of this magnificent feather palm. An eighty-foot palm of any species is something to admire but this one has other characters to give it class.

The cameras got into action and should show this first specimen well but we were to see others and finer ones that afternoon as we strolled up the road from the little hotel at Noongan forty miles in the interior of Celebes. I shall never forget that first afternoon with the *Pigafettia elata* palms. The afternoon light lit up their magnificent crowns for they have leaves as large as those of the coconut. These leaves are densely covered with brown spines that look as slender as cambric needles densely set all over their bases. There they were stretching their magnificent heads above the forest; some of them to a

height of a hundred feet or more. Perhaps some were 130 feet, we could not well estimate. The books give this height as their limit. The roadway wound up the hill and down into a valley and as we crossed the divide and looked down into that valley the sight of several tall *Pigafettia* palms standing in a group near the road completely took my breath away. I thought I had seen beautiful palms before, such as the Royals in Cuba and Dominica and Rio, and the various palm species in the palm quarters of Peradinia and Buitenzorg. The tall Washingtonians in Palm Canon, the graceful date palms in Arabia and Egypt and Morocco; all these recollections swam through my mind as I stood there with Anne Archbold and Marian and Edward Beckwith gazing down on that valley as the afternoon light gradually faded away. I hate comparisons but I have to be frank with myself and admit that those *Pigafettias* impressed me at that moment as beyond any doubt the handsomest palms my eyes had ever rested on.

It was to see them, it is true, that we had come here. I had been since 1926, when I saw the specimen in Sumatra, longing to see the palm in its forest habitat and had been fearful that it might prove disappointing; and now that it stood there in all its beauty I was quite naturally delighted to find it far more beautiful than I had dared to dream it might be. I recalled that the upper third of the palm I saw in Sumatra was of a deep bright green color with rings at irregular intervals around it. Here these larger specimens exhibited that striking character to such a degree that it was quite imperative that color photographs and movies in color be taken of the palm. The weather was not good. Rain clouds hung over the valley. It took several visits on different days to get good views and even then the sunshine was not first rate. But perhaps these views of my favorite among the palms will prove sufficiently good to prove what I contend: that the *Pigafettia* is the queen of the feather palms. Its height, its perfectly straight columnar trunk, its brilliant green upper part of the trunk, its crown which arises without any narrowing of the trunk below it and the handsome markings in grey, irregular grey narrow bands, which characterize it, are the points which I would emphasize. May this palm prove adapted to growth in South Florida and may it grow as rapidly there as it does in Celebes. A palm that

was eighty feet high here was testified to by the natives as not over twenty years old. It is a very rapidly growing species, given plenty of water and a tropical climate.

As I write these words I look at the calendar and see that it is now early February in Florida and I cannot help wondering what low temperatures have visited those little palms in the Chapman Field garden and whether they have succumbed, in which case my dream of the establishment there of this queen of the palms becomes merely a dream. But the *Pigafettia* palm is not the only beautiful palm of this Minahassa region. We soon discovered this, for, peering down from the forest above the winding roadway, Marian saw the red stem of something and it turned out to be the red leaf-sheath of a species of *Areca* which when Hugo got the fruit clusters of it, proved to be quite an amazing palm. It has tall stilt roots that raise it several feet above the ground. Its leaf-sheaths are a beautiful lacquer red, resembling in color those of the famous "Sealing Wax Palm". But unlike this it has a fruit cluster that is throughout a beautiful lacquer red and its inch-long fruits are of the same color. Those of the Sealing Wax Palm are black and the stems of its fruit cluster are of a pinkish hue. It is with a feeling of great pleasure that we shall mail a lot of the seeds of this red fruited palm packed in moist

peat as soon as we can discover when the next mail goes from Menado.

This disconnected account of the voyagings of the Cheng Ho up to date is so fragmentary that I hesitate to send it to the members of the garden and did I not feel that they all know how fragmentary any kind of a life is I would not do so. From Celebes, where we shall be for several weeks perhaps, we expect to work our way across to Ternate and down among those islands which lie along the West coast of Halmaheira until we reach that wooded island of Batchian about which nearly a century ago Alfred Russell Wallace was so enthusiastic.

The greetings of Anne Archbold and Marian Fairchild accompany this letter and to it I may add those of Captain Kilkenny, our "Liaison Officer", Daan Hubrecht, First Mate Fant and Fenton Kilkenny, who at the present moment are busy substituting bamboo poles for the wooden battens with which the Cheng Ho's sails are stiffened. Of the excellent work of my assistant, Hugo Curran, I have already spoken. I wish that the members of the Garden might see him as he clambered up giant liana into the top of a forest tree after the yellow fruits of it which still remain unidentified on my desk on the Junk.

With affectionate regards to the members of the Fairchild Tropical Garden, I remain, very sincerely,

DAVID FAIRCHILD.

Right—The Bahay Kubo from the roadway.



Below—The famous terraces of Banaue which have been built by the Igarots.



Right—Marian Fairchild and David Fairchild standing on the edge of the steep hillside which overlooks the famous terraces of Banaue which have been built by the Igarots and which are today the most extensive and perfect agricultural terraces in the world. Rice and sweet potatoes are almost the only agricultural crops grown on these terraces which have cost such untold human effort. Whether some day or other a greater variety of crops will be grown here is a question that only time can answer.

